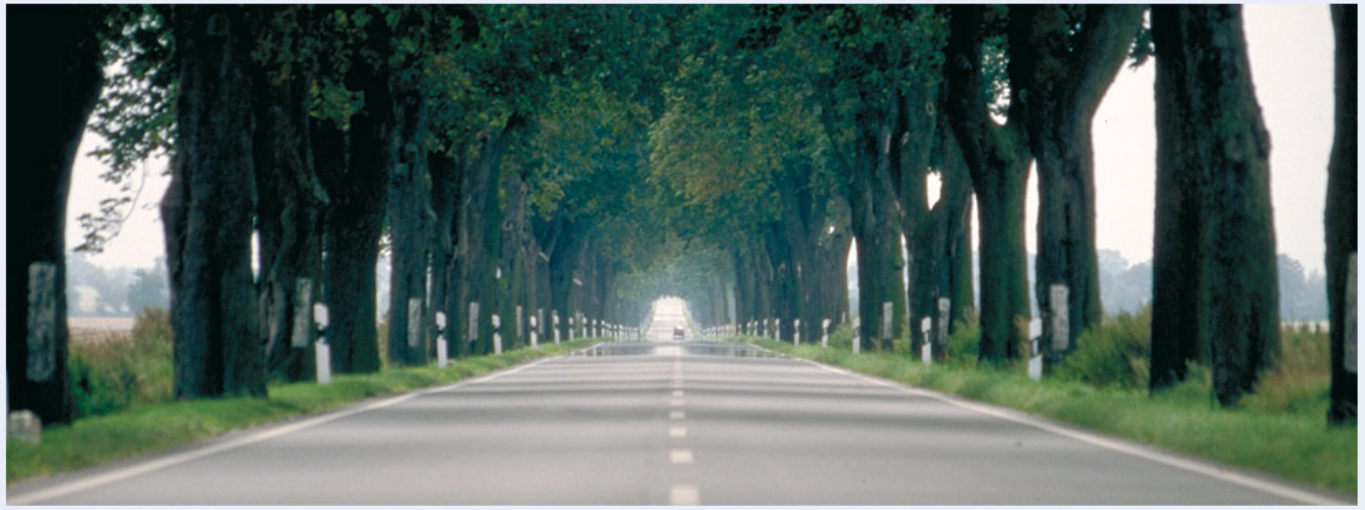
Software for
Traffic Information and Management



Keeping Travelers Moving Worldwide

TIC Smart Client For PDA
California 511 Workshop
10/28/08

GEWI GmbH • Solbadstrasse 2 • 06406 Bernburg • Germany
Tel:+49.3471.640511 • Fax:+49.3471.640578 • Email: tic@gewi.com • Web: www.gewi.com/tic

Jim O'Neill
Transportation / 511 Experience

1987 - Metro Traffic Control -Sacramento
Director of Operations
-Directed all local traffic operations

1988 - Metro Traffic Control - Houston
VP Operations - Western USA
-Responsible for Western US Traffic Ops.

1995 - Metro Traffic Control - Houston
VP Product Development
-Developed WebTraffic Product - TeleAtlas
-Developed RealTraffic Product - MapTuit
-Worked on WON/SRS public sector projects

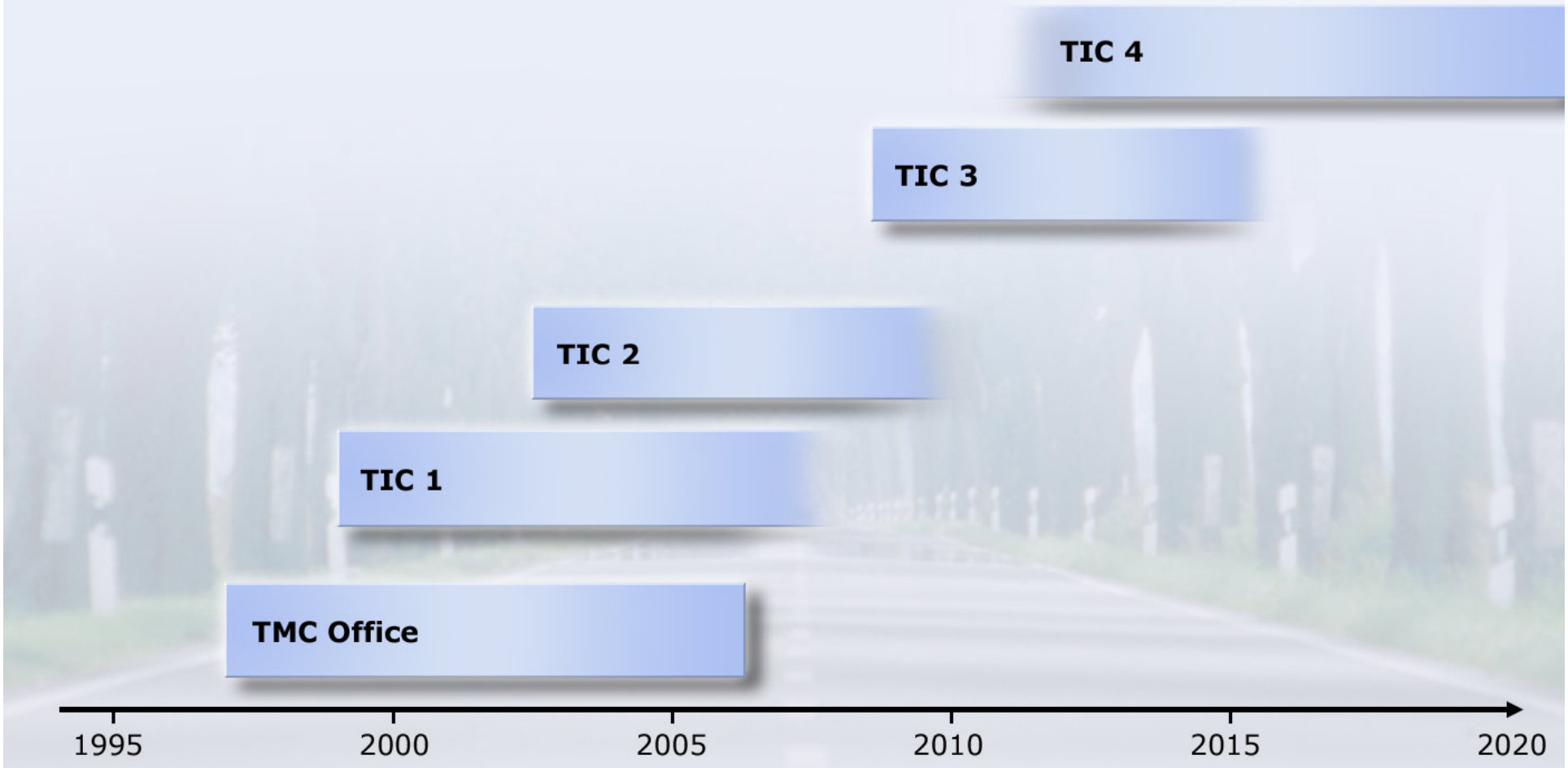
2003 - SmartRoute Systems - Houston/Boston
VP/General Manager
-Oversight on Various 511 Systems
-South Florida
-VDOT, NCDOT, NJDOT
-Boston SmarTraveler Project

Member of 511 Deployment Coalition

GEWI
Business

- **Name** GEWI
- **Location** Germany, Bernburg
- **Founded** 1992
- **Directors** Hagen Geppert
  Karl Will
- **Resources** 20
- **Certified** ISO 9001:2000
  annually since 1998.
- **Business areas** Consumer electronics
  Traffic telematics
- **Company structure** GEWI Engineering GmbH
  GEWI Hard- und Software Entwicklungsgesellschaft mbH

Traffic Info Centre "TIC"
History



- **TIC Executable Code for Windows.**
  - Software platform for processing data such as traffic on Windows PC's.
- **TIC Compact Executable Code for Windows**
  - Software platform for processing data such as traffic on PDA's, PND's, and mobile phones.
- **TIC FM Radio G313**
  - Hardware for receiving RDS (FM Subcarrier Radio Data Systems) data off-air.
- **TIC DAB Radio G311.**
  - Hardware for receiving DAB (Digital Audio Broadcasting) data off-air.

- **Government agencies such as police and DOT's.**
  - European Road Information Center (ERIC) runs on TIC
    - (22 countries in 7 languages)
  - SouthWest Florida 511
- **Commercial service providers.**
  - NAVTEQ/Traffic.com
- **Radio stations.**
- **Automobile clubs.**
- **Road operators.**
- **Car and navigation device manufacturers.**
  - BMW USA
  - Daimler/Chrysler

TIC
Customer projects

TIC
Customer project NAVTEQ NA

Navteq Project Detail

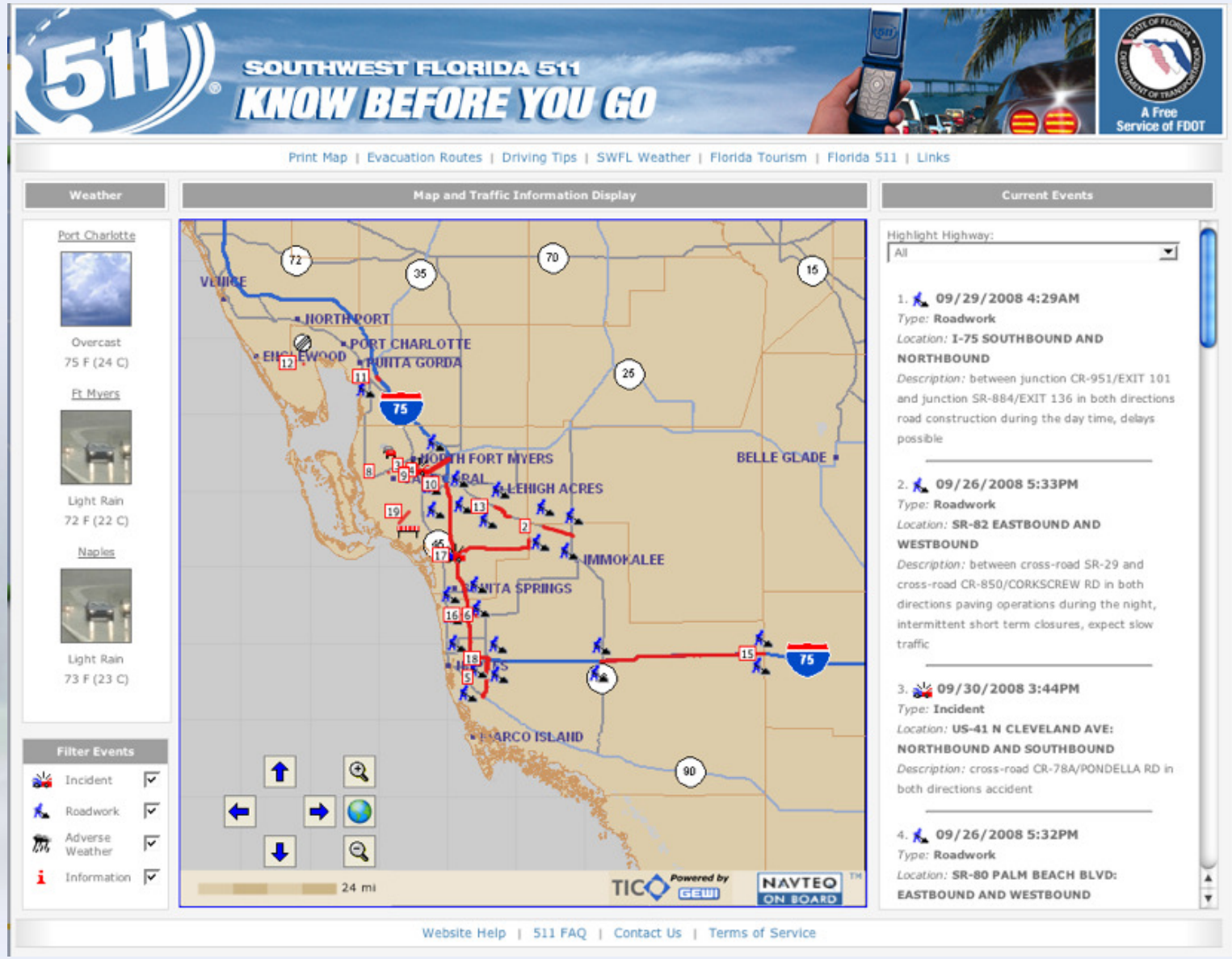
PROJECT START: 2003

PROJECT MISSION: The main purpose of the system is to aggregate high quality traffic information sources from the main US markets into one system such that these can be distributed to business customers.

DATA INPUT: The TIC Software consists of multiple TIC Servers which receive from multiple data sources from across the USA, including from traffic event databases and road sensors, from both government and commercial organizations. The TIC NAVTEQ installation is continuously receiving and processing over 20,000 sensors collected from many cities across the USA including metropolitan areas such as Chicago, Detroit, New York, Houston, Los Angeles, Philadelphia, and San Francisco.

CURRENT OPERATIONS: , NAVTEQ's TIC Server in Chicago supplies live location and event coded data for two commercial US satellite service providers (XM and Sirius) for navigation receivers in twenty markets across the USA for use in vehicles manufactured by companies such as Cadillac and Honda.

TECHNICAL CONFIGURATION:
Two complete sets of TIC Servers are installed, one in a primary location in one city and another in a secondary location in a second city. Automatic failover mechanisms switch from the primary to secondary sites with a few minutes.


511
SOUTHWEST FLORIDA 511
KNOW BEFORE YOU GO
A Free Service of FDOT
Print Map | Evacuation Routes | Driving Tips | SWFL Weather | Florida Tourism | Florida 511 | Links
Weather
Map and Traffic Information Display
Current Events
Port Charlotte
Overcast
75 F (24 C)
Ft Myers
Light Rain
72 F (22 C)
Naples
Light Rain
73 F (23 C)
Filter Events
Incident
Roadwork
Adverse Weather
Information
NORTH PORT
PORT CHARLOTTE
PUNTA GORDA
LEHIGH ACRES
IMMOKALEE
BELLE GLADE
24 mi
Powered by GEWI
NAVTEQ ON BOARD
Highlight Highway:
All
1. 09/29/2008 4:29AM
Type: Roadwork
Location: I-75 SOUTHBOUND AND NORTHBOUND
Description: between junction CR-951/EXIT 101 and junction SR-884/EXIT 136 in both directions road construction during the day time, delays possible
2. 09/26/2008 5:33PM
Type: Roadwork
Location: SR-82 EASTBOUND AND WESTBOUND
Description: between cross-road SR-29 and cross-road CR-850/CORKSCREW RD in both directions paving operations during the night, intermittent short term closures, expect slow traffic
3. 09/30/2008 3:44PM
Type: Incident
Location: US-41 N CLEVELAND AVE: NORTHBOUND AND SOUTHBOUND
Description: cross-road CR-78A/PONDELLA RD in both directions accident
4. 09/26/2008 5:32PM
Type: Roadwork
Location: SR-80 PALM BEACH BLVD: EASTBOUND AND WESTBOUND
Website Help | 511 FAQ | Contact Us | Terms of Service

SWFLA 511 Project Detail

End-user organization	Florida Department of Transport (DOT) District One, in South West Florida, 801 N. Broadway Ave., P.O. Box 1249, Bartow, FL, 33831-1249, USA
Used for	US DOT 511 service.
Project description	• Collect travel time data. • Manually create traffic event data. • Distribute travel time and traffic event data to a 511 IVR and website.
Geographical coverage	South-West Florida
Project period	• Project started: 01.01.2006. • Operation started: 01.07.2007.
Product generation	TIC Executable Code for Windows (TIC2).
Customer	Post, Buckley, Schuh & Jernigan, Inc., 2001 NW 107 Avenue,

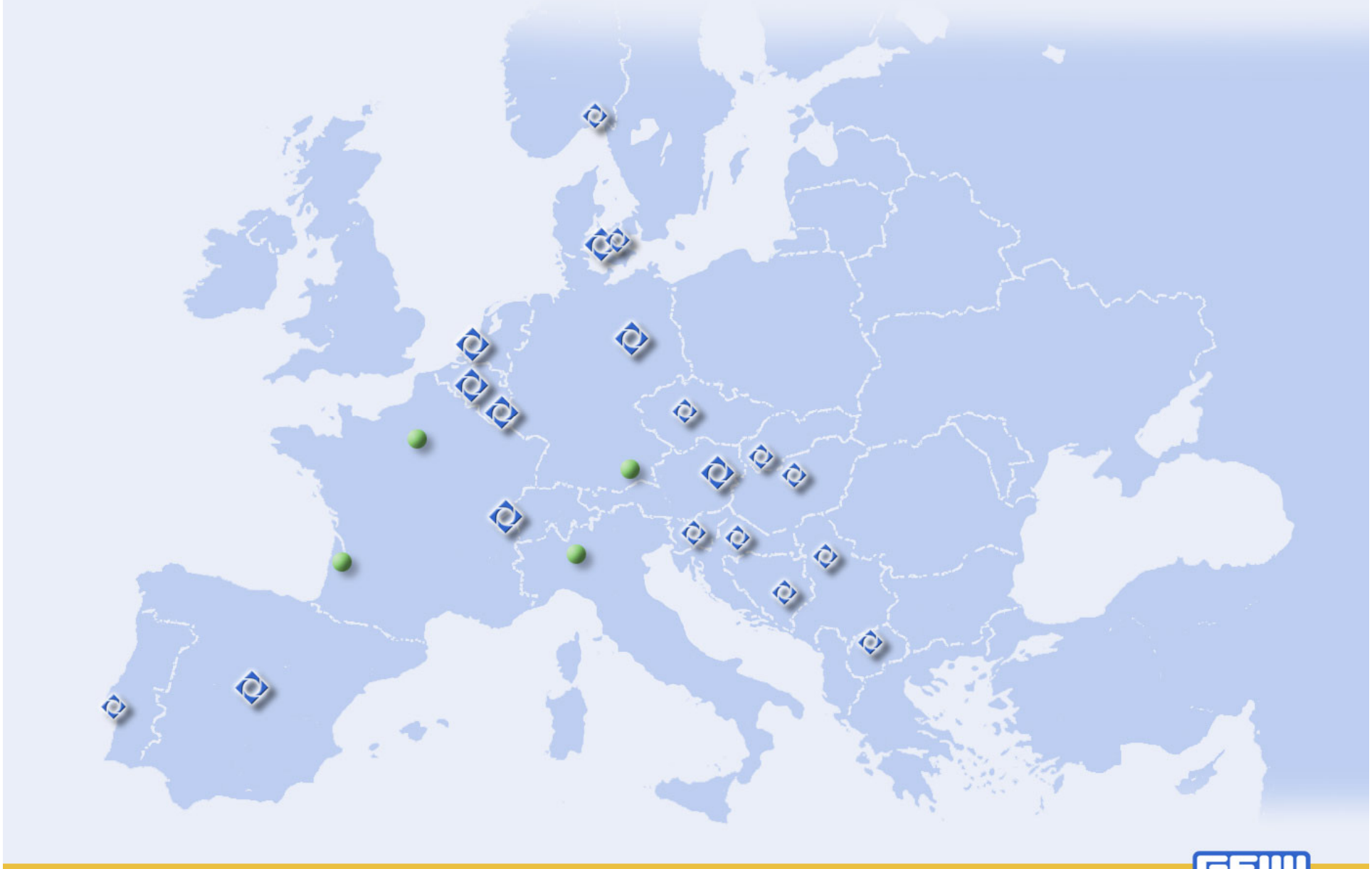
BMW USA - Daimler/Chrysler Project Info

Project Mission: Navigation Testing

Both BMW USA and Daimler Chryser use GEWI in labs to test their Navigation Systems. Labs create incidents, check alternative routes, proper incident display characteristics.

NOTE: In Europe, 15-20 million Navigation Systems are in use. This allows DOT's to use the Nav System as part of traffic management. DOT's can notify driver (by system type) and include DOT preferred diversion.

TIC
Customer project ERIC (European Road Information Center)



E.R.I.C Project Details

About ERIC:

- 22 organizations in 22 European countries.
- Coverage of more than 80% of European roads.
- More than 450 million European people represented.
- More than 100,000 travel messages per month distributed.
- Headquarters and central communication in Geneva, connected to all member info centers.
- Provides real-time exchange between the organizations.
- Fully automated with the ERIC 3000 system as provided by GEWI.
- Traffic information gathered/distributed in 7 different languages.

The ERIC 3000 system consists of a central TIC Server that connects the member organizations. The ERIC 3000 system operates according to European standards for coded information exchange like DATEX or RDS-TMC:

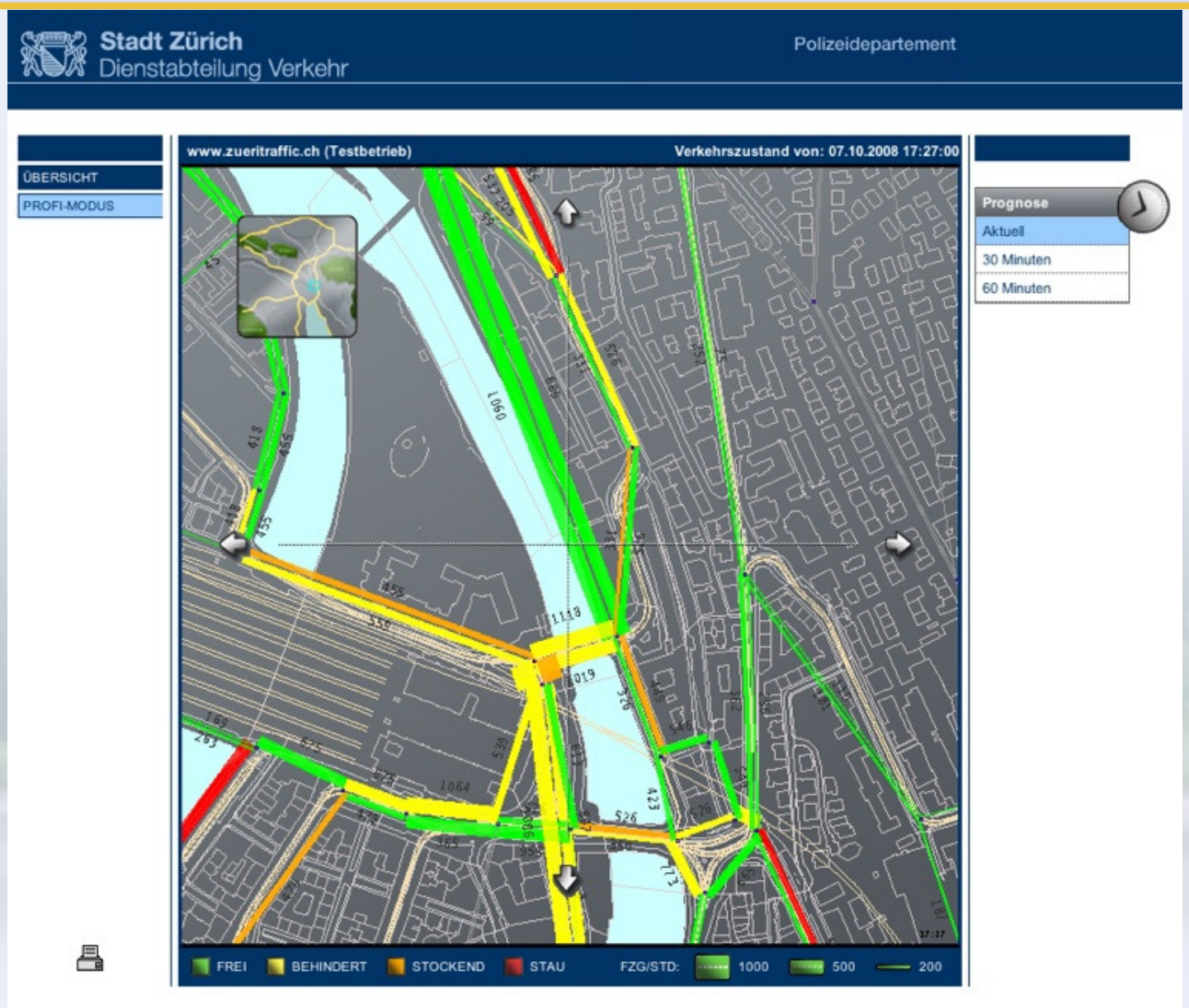
- Localization coding with geographical data-base support (RDS-TMC location and event coding).
- Standalone- or network – solution for members.
- Subscription and filter facilities (to receive only information needed).
- First-line support via ERIC operational Management.
- Second-line support via GEWI in Bernburg.
- The ERIC 3000-system enables connection with various in-house systems.
- ERIC 3000 is DATEX and RDS-TMC compliant.

Zurich Traffic Flow Project Details

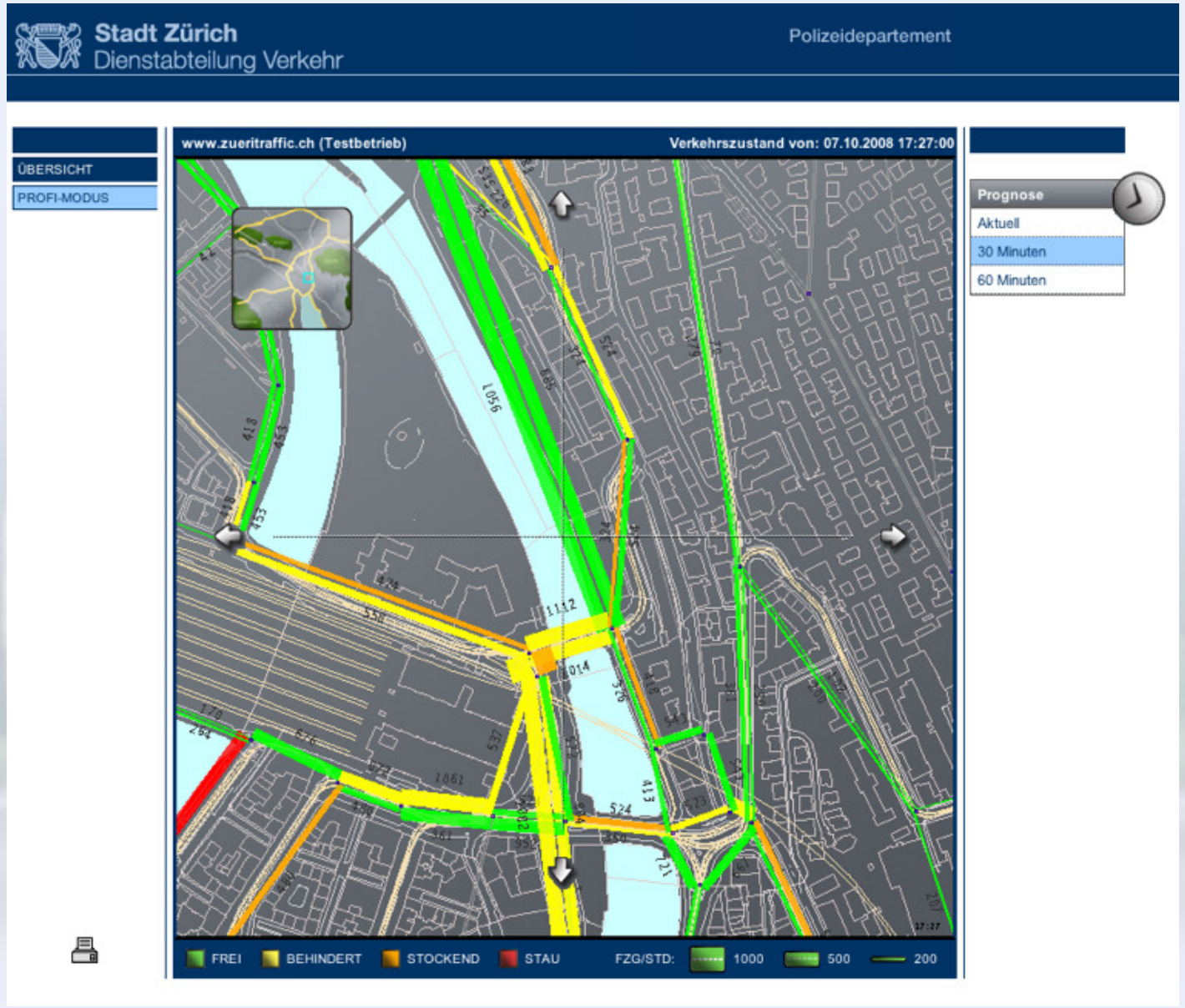
Stadt Zürich
Dienstabteilung Verkehr
Polizeidepartement

End-user organization	City of Zurich, Switzerland.
Used for	See http://www.zueritraffic.ch/.
Project description	• Collect data from 1.000 road sensors (traffic lights) and taxi fleet. • Compute level of service including spatial completion and short-term forecast. • Show live traffic flow including forecast on a map for the website.
Geographical coverage	City of Zurich.
Project period	• Project started: 01.07.2000 • Operation started: 01.07.2001
Product	POLYDROM.

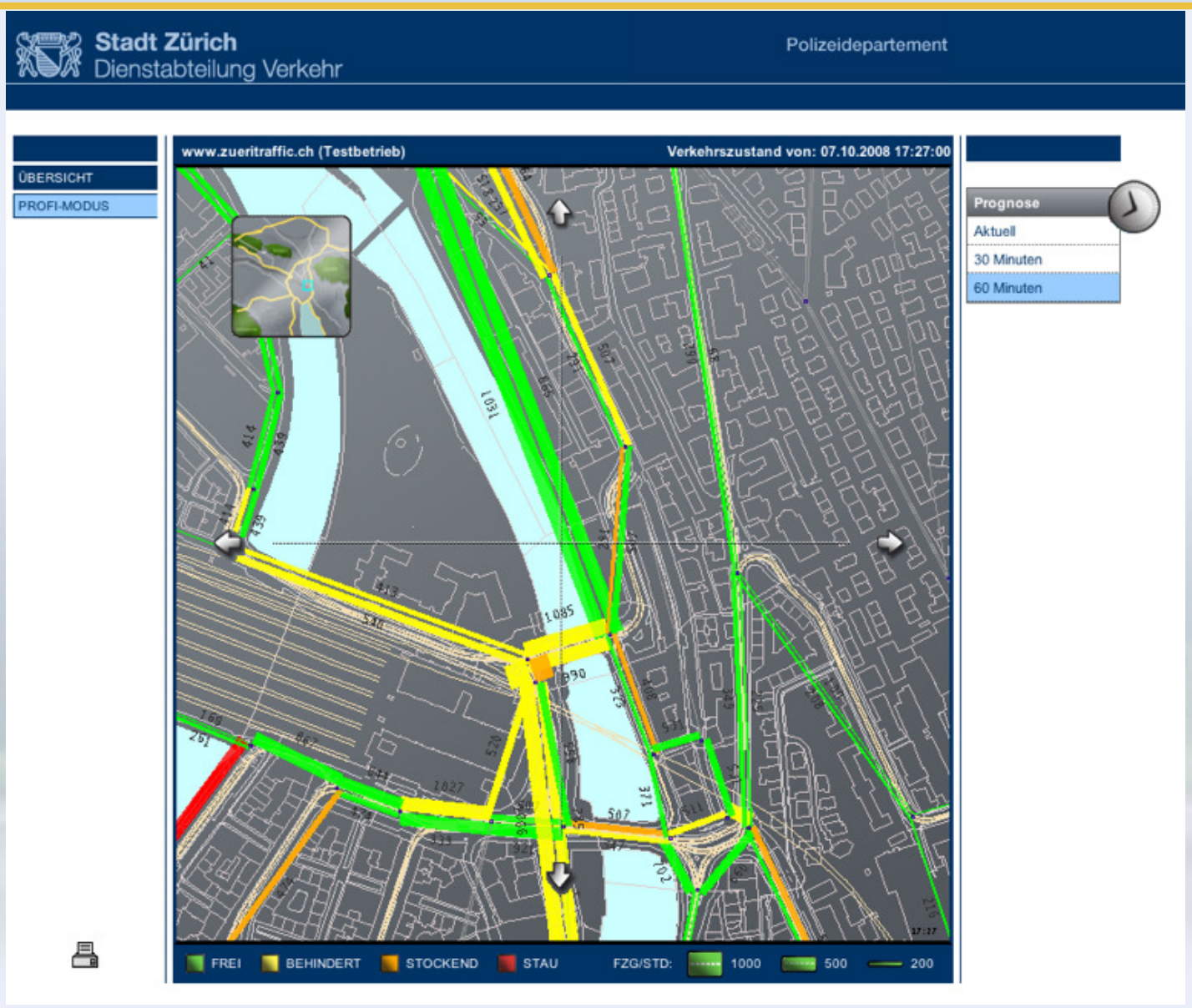
Zurich Traffic Flow - Current



Zurich Traffic Flow - 30 Minute Forecast



Zurich Traffic Flow - 60 Minute Forecast



Denmark Traffic Info System

Project Details:

End-user organization	Danish Road Directorate, Niels Juels Gade 13, 1022 Copenhagen K, Denmark
Used for	Traffic information, RDS-TMC service.
Project description	• Collect traffic event data from multiple systems. • Manually create traffic event data. • Distribute traffic event data to multiple systems. • RDS-TMC Broadcast.
Geographical coverage	Denmark
Project period	• Project started: 01.05.06. • Operation started: 01.09.06.
Product generation	TIC Executable Code for Windows (TIC2).
Customer organization	Danish Road Directorate, Niels Juels Gade 13, 1022 Copenhagen K, Denmark

Off-the-shelf	One core product.
Independence	User configurable. Custom components. Custom features.
Scalable	System architecture. Licensing.
Deployment	Fast and easy to install and learn. Full documentation.
Supported	24 x 7.
Maintained	New and improved features available regularly.
Reliable	Fourth generation since 1997.
Accepted	Over 70 projects operating worldwide.

World Class Features

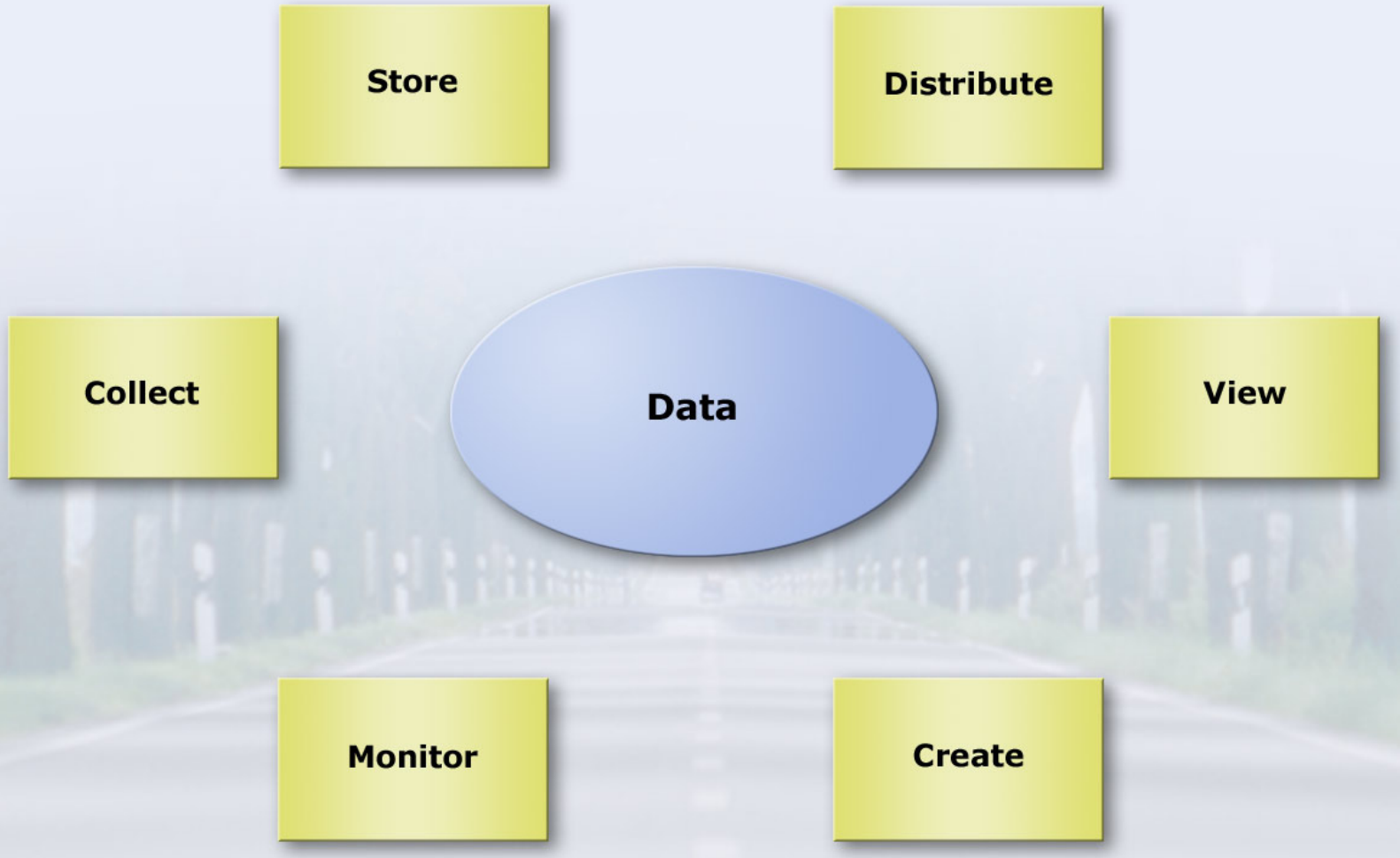
- PDA Incident Entry / Commuter Traffic Alerts.
- Traffic Forecasting.
- Spatial Completion
- Conforms to all current data standards. (and future in Dev)
- Universal Camera Remote Control.
- Automatically generate incidents based on traffic flow

  -Virtual 24/7 Operations

Easy To Deploy

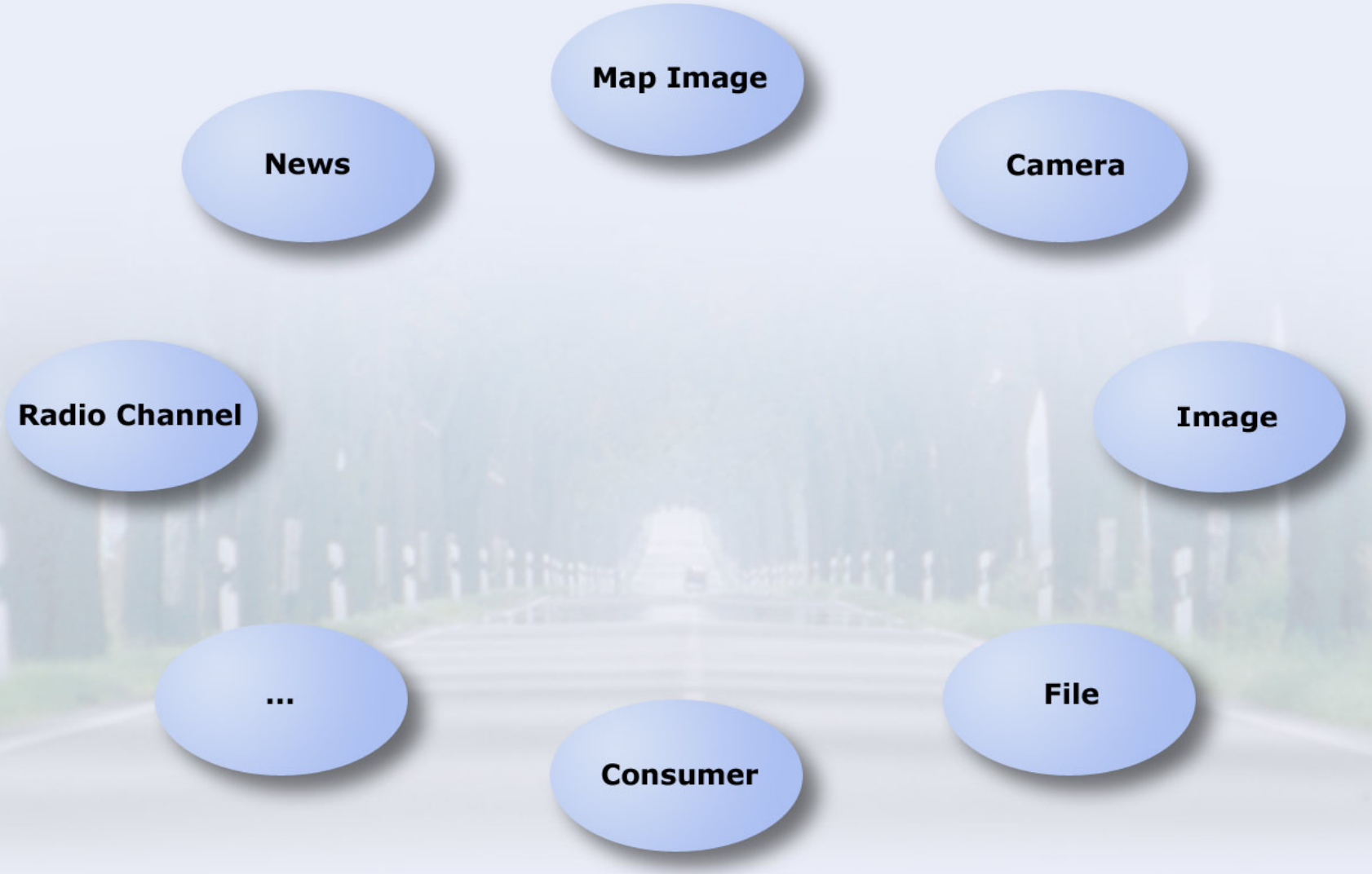
- No change to current systems. GEWI sits "on top" of existing system.
- Works with ANY data type.
- Can output to ANY Web or IVR service.
- Works with any contractor / subcontractor systems.
- Easy to replace existing systems when their useful life has ended.

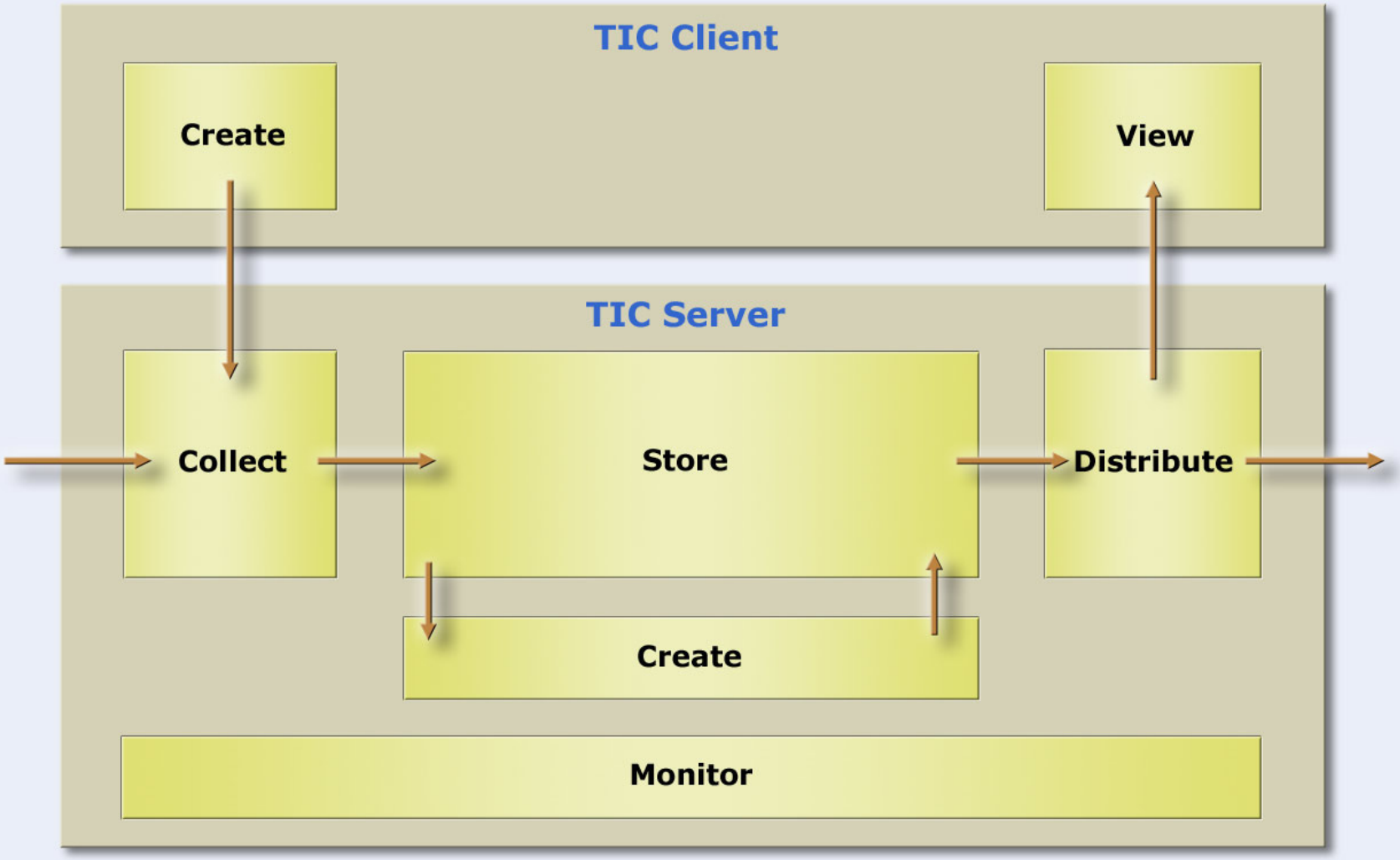
Main features
Processing



Main features
Data types

Main features
Data types



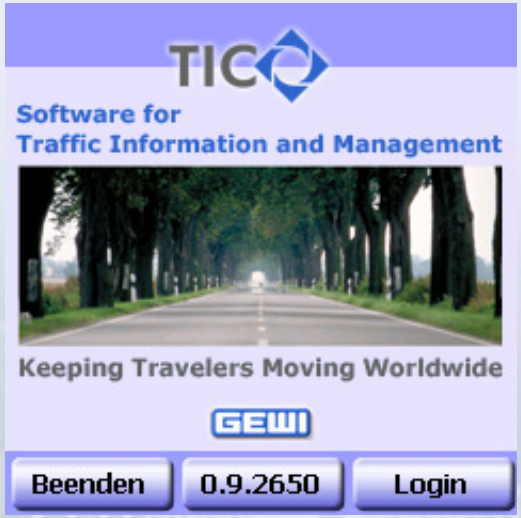

TIC Client
Create
View
TIC Server
Collect
Store
Distribute
Create
Monitor

Uses & Benefits

- Provides the user the ability to create and distribute traffic information via mobile device.
- Utilize existing, affordable hardware.
- Precisely locate the incident (accident)
- Precisely locate begin and end of a work zone, especially in moving work zone ex. Grass cutting
- PDA user has access to all live information.
- Can be used by police & government workers to enter traffic event data using a simple interface.

PDA Evaluation

Test project currently underway in a BMW Research project with the Bavarian State Police (similar to our State DPS)



TIC available in multiple languages including German, English & Spanish

PDA Requirements

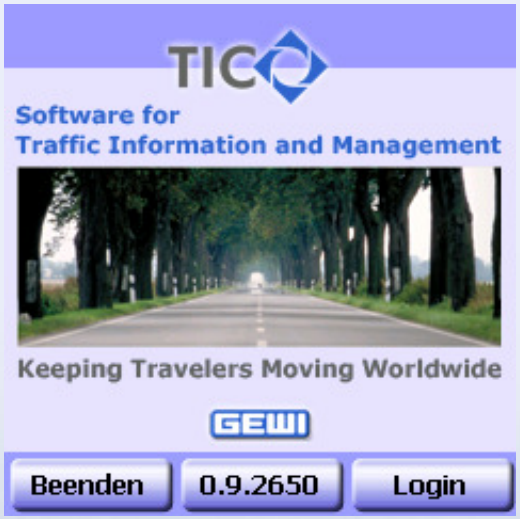
- GPS enabled receiver
- Internet connection
- Microsoft Windows Mobile OS
- Touch Screen

Starting the TIC client for PDA

1. Tap start

2. In the opening menu TIC tap mobile editor

Login



Once the program loads, tap Login to enter your PIN number

View Traffic Reports

All current reports are shown here in summary format.

Street name and street segment are shown.

The top menu bar shows that these are items 1-5 of 6 total, and the most recent report upate time.

Tap on a message box for information on, or to change that specific traffic message.

Tap MORE to view the next page of messages

Traffic Message Detail

Create New Report

Tap NEW (Neu) to create a new traffic message.

Creating a new event - Add Detail

Select event type

Select “wide area” or Start location

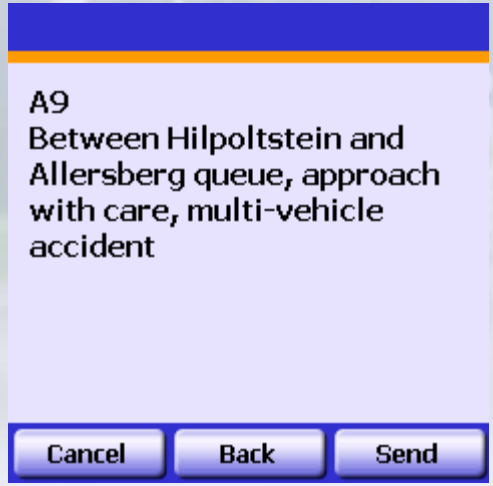
Determine location

Start selected……..…..Localization is running

User can also select “counter - direction”
to report events observed in the opposite direction of travel.

Edit or confirm message

Edit extent Menu



Confirm and send message

Event Codes - Examples

4 Event Codes

The following table explains events which appear in the mobile TIC editor.

Icon	Ereignis	Erläuterung
	**Defektes Fahrzeug**	**Im Falle eines oder mehrerer liegengebliebener Fahrzeuge.**
	**Gegenstände auf der Fahrbahn**	**Im Falle, dass Gegenstände die Fahrt stören, die möglicherweise nicht ohne weiteres um- bzw. überfahren werden können.**
	Verlorene Ladung	
	Fahrzeugteile	
	Große Gegenstände	
	Umgestürzte Bäume	
	**Personen auf der Fahrbahn**	**Im Falle von Menschen auf der Fahrbahn.**
	Kinder	
	Radfahrer	
	**Tiere auf der Fahrbahn**	**Im Falle von Tieren auf der Fahrbahn.**
	Wild	
	Tierherde	
	Kleintiere	
	Großtiere	
	**Brandgefahr**	**Im Falle von erhöhtem Brandrisiko. Es sollten vor Ort keine brennenden oder brandauslösenden Mittel verwendet werden.**

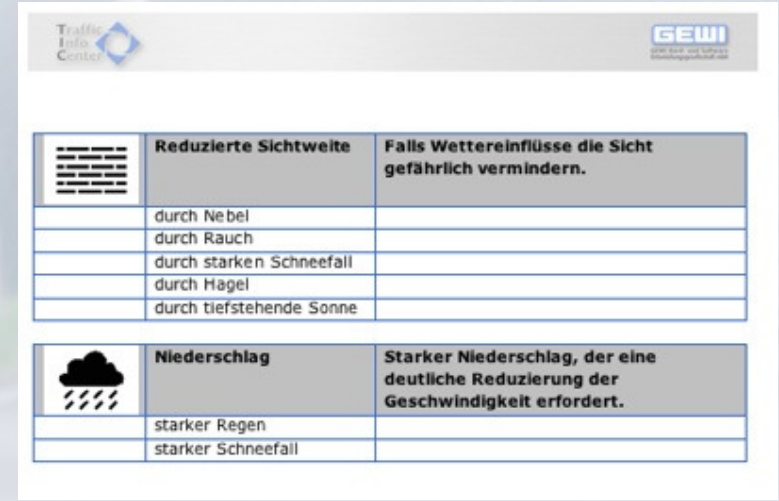
	**Unfall**	**Im Falle eines Unfalls.**
	Mit mehreren Fahrzeugen	
	schwerer Unfall	
	mit Lkw	
	mit Bus	
	mit Gefahrguttransporter	
	ungesicherte Unfallstelle	
	**Gefährliches Stauende**	**Im Falle von akuter Auffahrunfallgefahr.**
	Plötzlich	
	hinter Kuppe	
	hinter Kurve	
	im Tunnel	
	**Schaulustige**	**Im Falle, dass z. B. Schaulustige einen Unfall auf der Gegenfahrbahn beobachten, aber auch an Stellen wo Attraktionen am Straßenrand zum abbremsen verleiten.**
	**Schwertransport**	**Schwertransporte (ohne Überbreite) mit langsamer Fahrt.**
	**Herannahendes Einsatzfahrzeug; Gasse bilden!**	**Im Falle, dass sich ein Rettungsfahrzeug etc. von hinten nähert.**
	**Wanderbaustelle**	**Behindert den Verkehrsfluss und kann sich bewegen.**
	**Falschfahrer (Geisterfahrer)**	**Im Falle von Fahrzeugen die in falscher Richtung fahren (nicht stehen).**

Event Codes - Standards

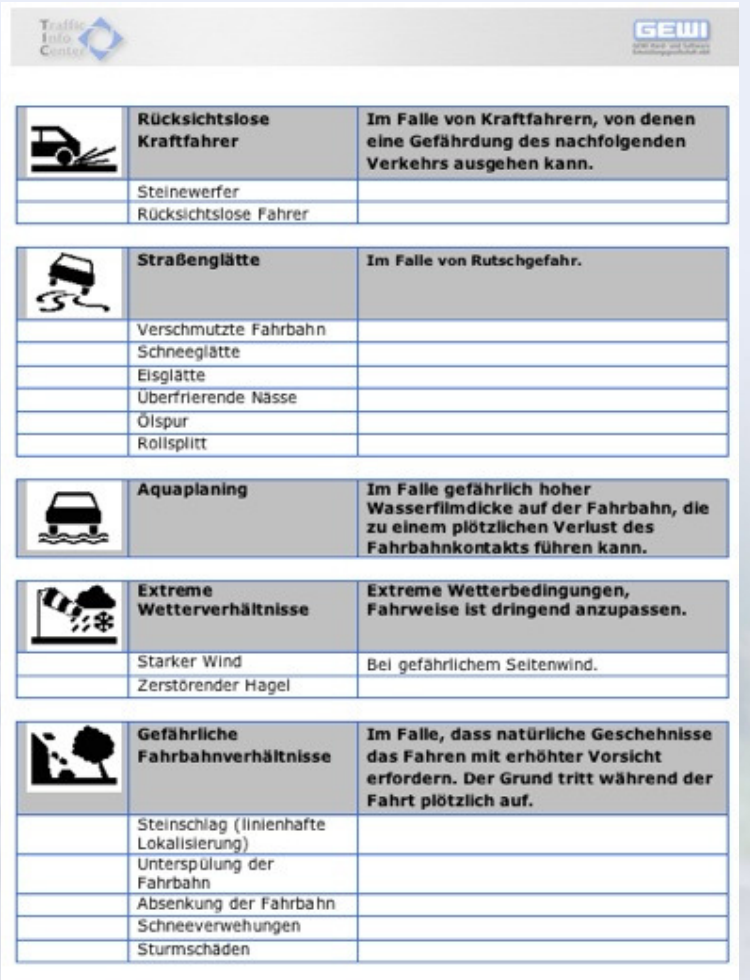
Event codes can be any subset of:

TMC
Worldwide, based on ALERT-C

SAE
USA, based on TMC



	Reduzierte Sichtweite	**Falls Wettereinflüsse die Sicht gefährlich vermindern.**
	durch Nebel	
	durch Rauch	
	durch starken Schneefall	
	durch Hagel	
	durch tiefstehende Sonne	
	Niederschlag	**Starker Niederschlag, der eine deutliche Reduzierung der Geschwindigkeit erfordert.**
	starker Regen	
	starker Schneefall	

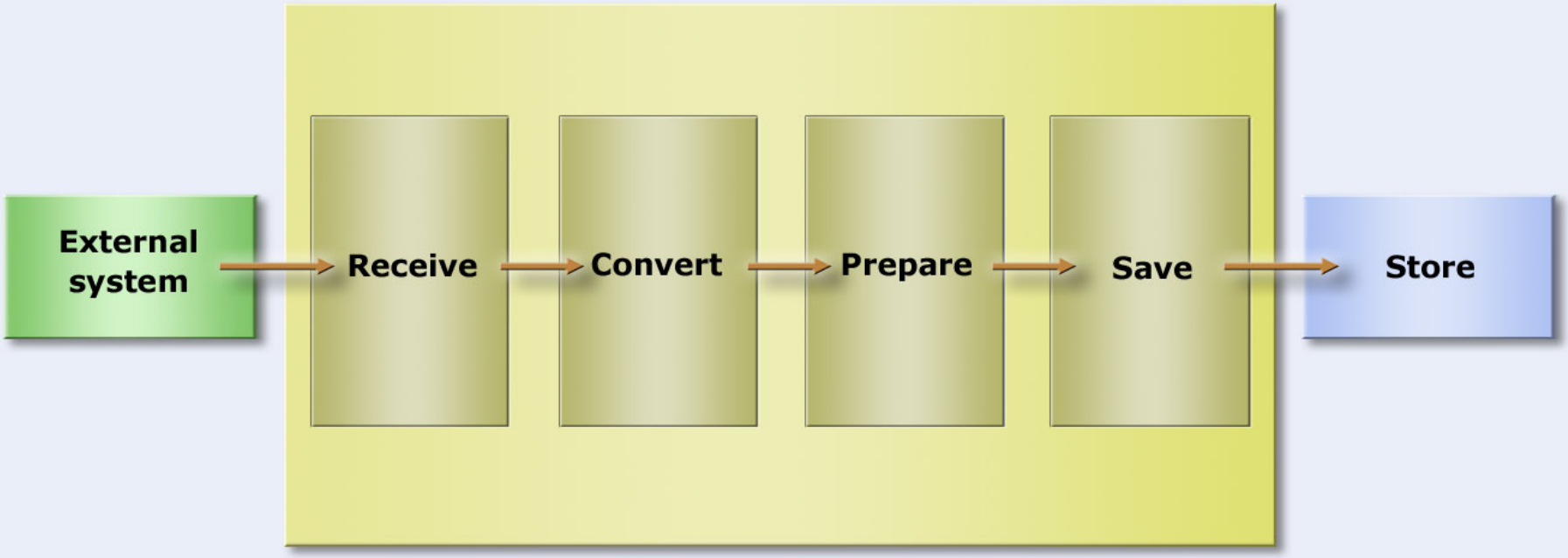


	Rücksichtslose Kraftfahrer	**Im Falle von Kraftfahrern, von denen eine Gefährdung des nachfolgenden Verkehrs ausgehen kann.**
	Steinewerfer	
	Rücksichtslose Fahrer	
	Straßenglätte	**Im Falle von Rutschgefahr.**
	Verschmutzte Fahrbahn	
	Schneeglätte	
	Eisglätte	
	Überfrierende Nässe	
	Ölspur	
	Rollsplitt	
	Aquaplaning	**Im Falle gefährlich hoher Wasserfilmdicke auf der Fahrbahn, die zu einem plötzlichen Verlust des Fahrbahnkontakts führen kann.**
	Extreme Wetterverhältnisse	**Extreme Wetterbedingungen, Fahrweise ist dringend anzupassen.**
	Starker Wind	Bei gefährlichem Seitenwind.
	Zerstörender Hagel	
	Gefährliche Fahrbahnverhältnisse	**Im Falle, dass natürliche Geschehnisse das Fahren mit erhöhter Vorsicht erfordern. Der Grund tritt während der Fahrt plötzlich auf.**
	Steinschlag (linienhafte Lokalisierung)	
	Unterspülung der Fahrbahn	
	Absenkung der Fahrbahn	
	Schneeverwehungen	
	Sturmschäden	

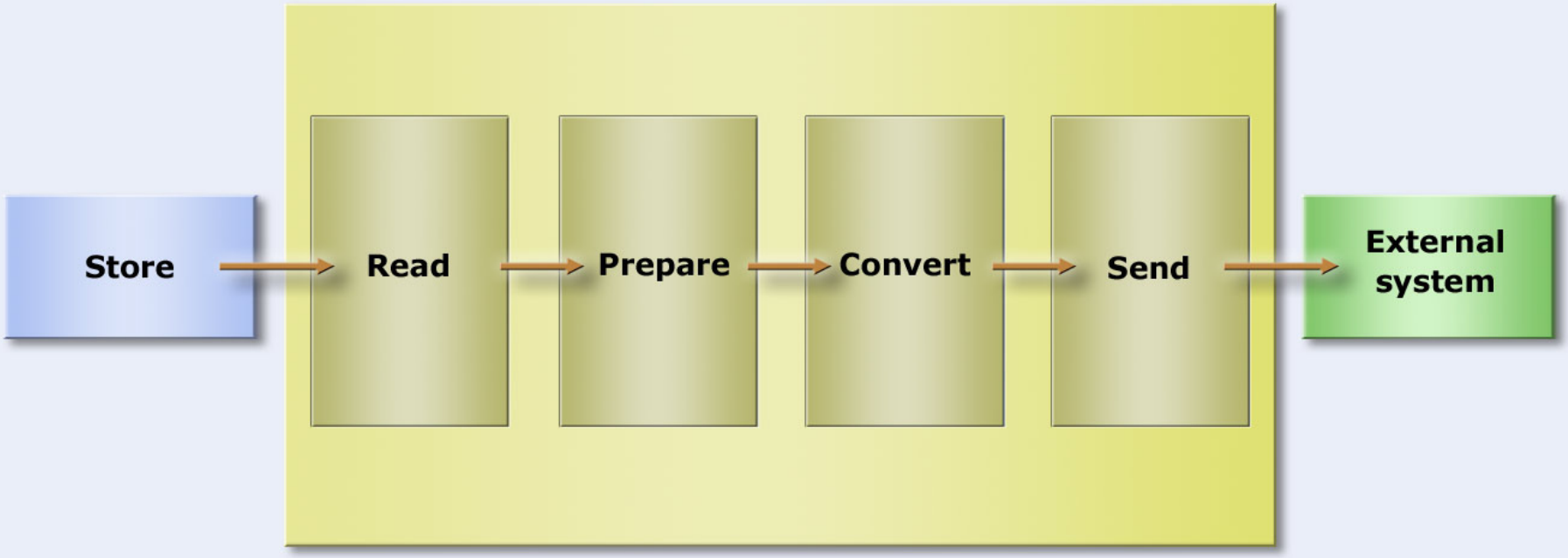
TIC System Architecture

- **Consists of components:**
  - Collect.
  - Distribute.
  - Automatically create.
  - Monitor.
- **Scalability of components:**
  - Scale vertically: multiple components can run on one machine.
  - Scale horizontally: components can be run on multiple machines.

Architecture
TIC Server component “Collect” (steps)

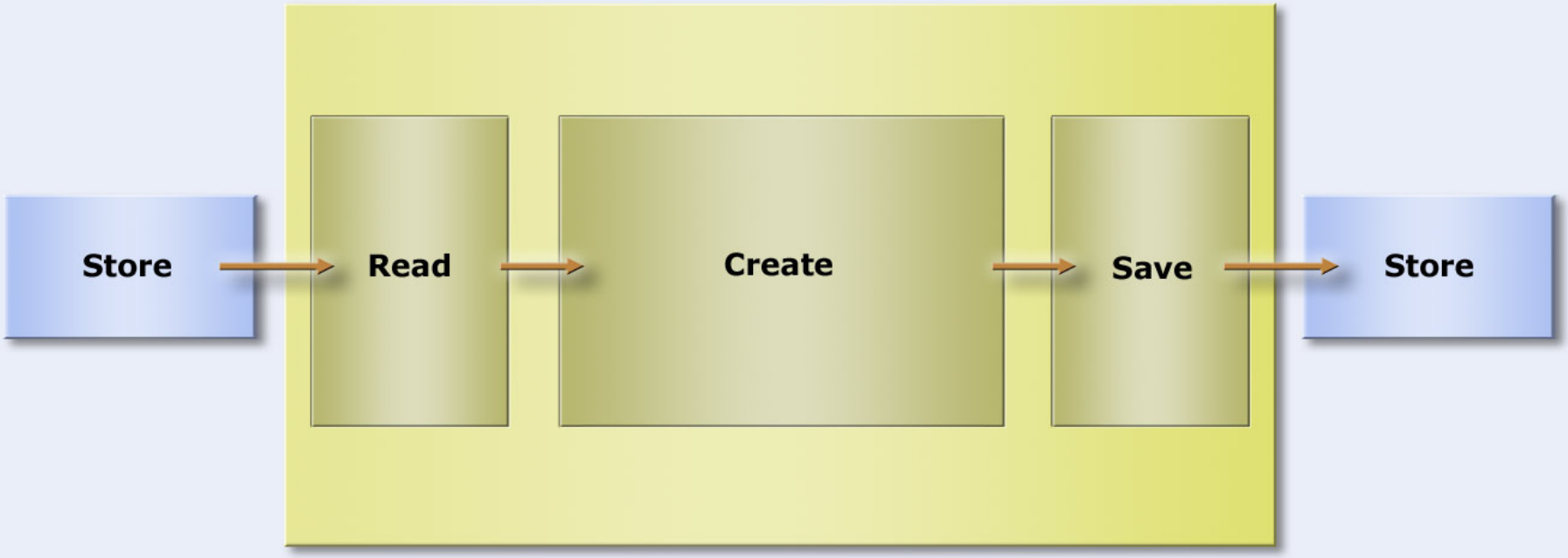


Architecture
TIC Server component “Distribute” (steps)



- **Traffic Flow from Road Sensor.**
- **Traffic Flow from Vehicle.**
- **Traffic Event from Traffic Flow.**
- **Traffic Flow from Traffic Flow:**
  - Spatial completion.
  - Time completion (forecast, prediction).
- **… and more.**

Architecture
TIC Server component “Automatically create” (steps)



- **Supports the following connection types:**
  - Web Service (SOAP over HTTP).
  - Windows File System.
  - FTP.
  - HTTP File Transfer.
  - TCP/IP.
  - Email (POP3 , SMTP).
  - Serial.

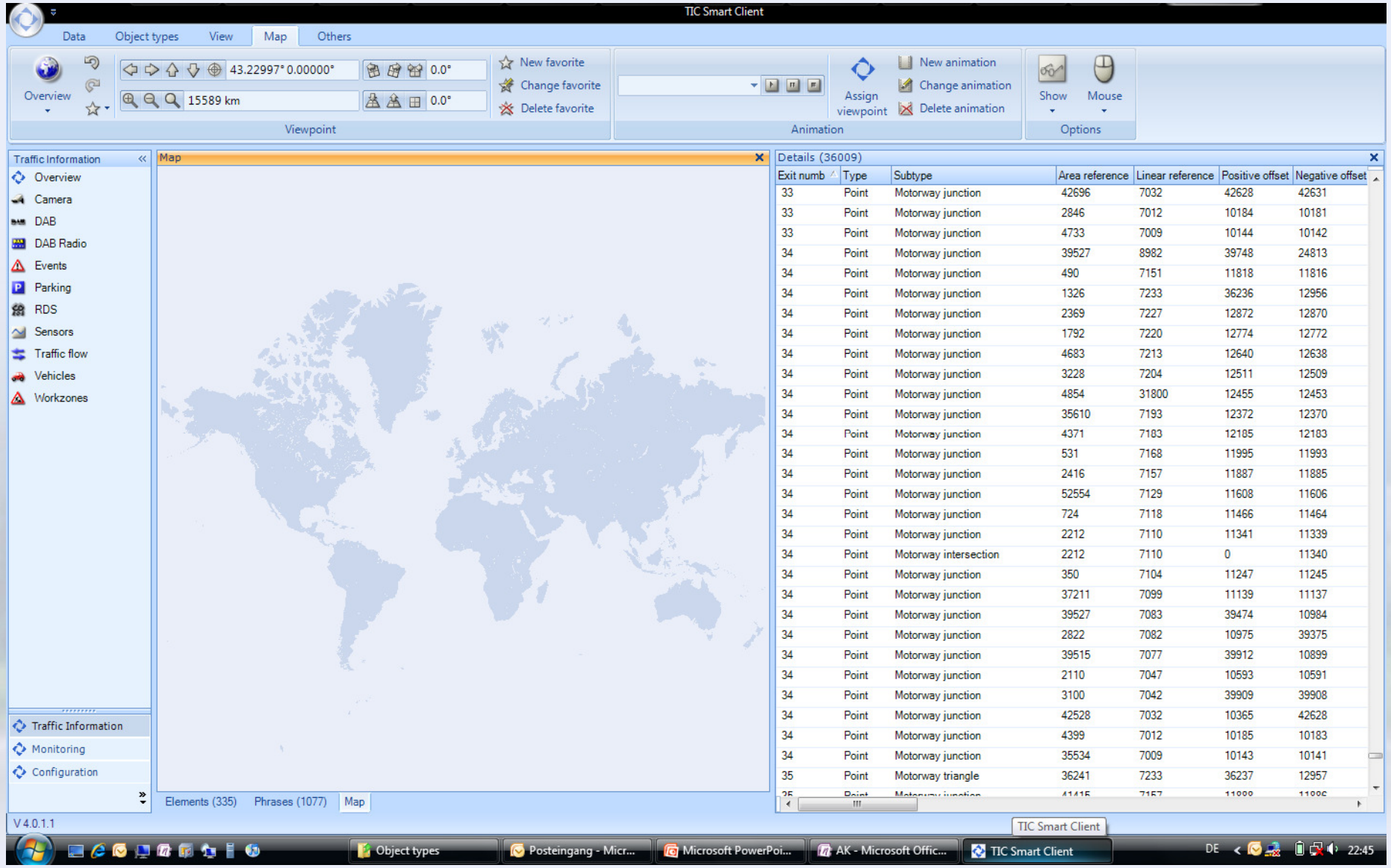
- **Hierarchical data model.**
- **Data processed by objects.**
- **Data types are implemented as object types.**
- **Object types define the different sets of elements and hierarchical structures.**
- **XML schema can be derived automatically.**

- **Uses a database management system:**
  - MS SQL Server 2005:
    - Standard Edition.
    - Compact Edition (included).
  - Oracle (planned).
- **Stores all data such as:**
  - Content and configuration.
  - Live and historical.

- **Resources: 10.**
- **Development platform**
  - MS Visual Studio 2008
  - MS Team Foundation Server.
- **Based on C# and MS .NET 3.0.**
- **Weekly development releases.**

- **TIC Smart Client**
  - For high operator productivity on a PC.
  - Web based deployment.
  - Incremental automatic updates.
  - Connectivity based on Web service (SOAP over HTTP).
- **TIC Browser Client**
  - For use on any PC or PDA installed with a Web browser.
  - Most popular Web browsers are supported.
  - Moderate performance.
  - Functionality not as rich as TIC Smart Client.
- **Multiple clients can be connected.**

Architecture
TIC Smart Client



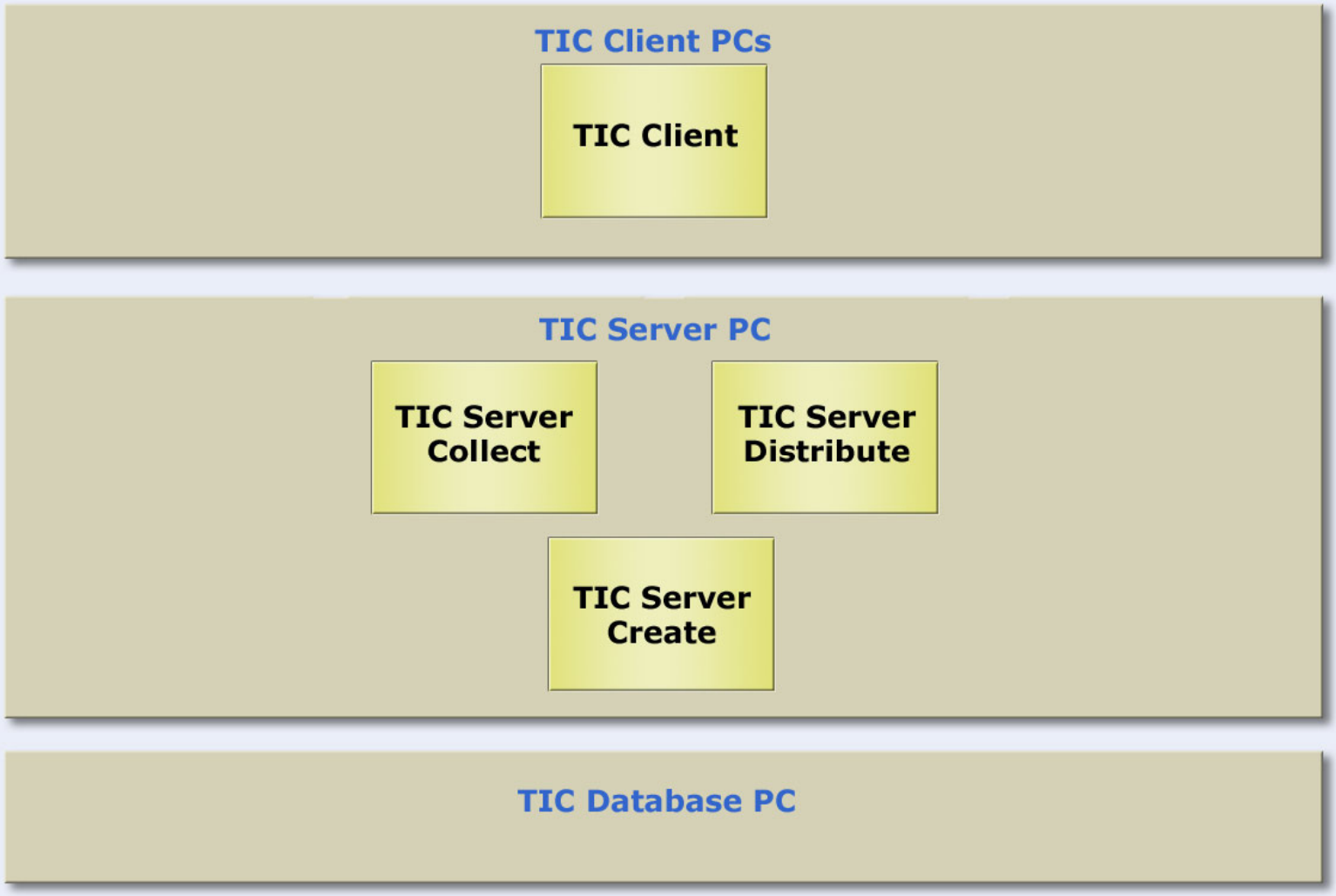
- **Processor** Dual 32-bit 3 GHz Intel or compatible Pentium IV.
- **Operating system** Windows Server 2003.
- **System memory** 2 GB free memory.
- **Hard-disk** 10 GB free space as hardware SCSI RAID 0/1.
- **Network** 100 Mbps TCP/IP.
- **Drive** DVD-ROM.
- **Graphics** XGA (1024x768), DirectX 9c, 128 MB memory.
- **Monitor** 15”.
- **Time** Reliable time source (DCF 77 or SNTP).

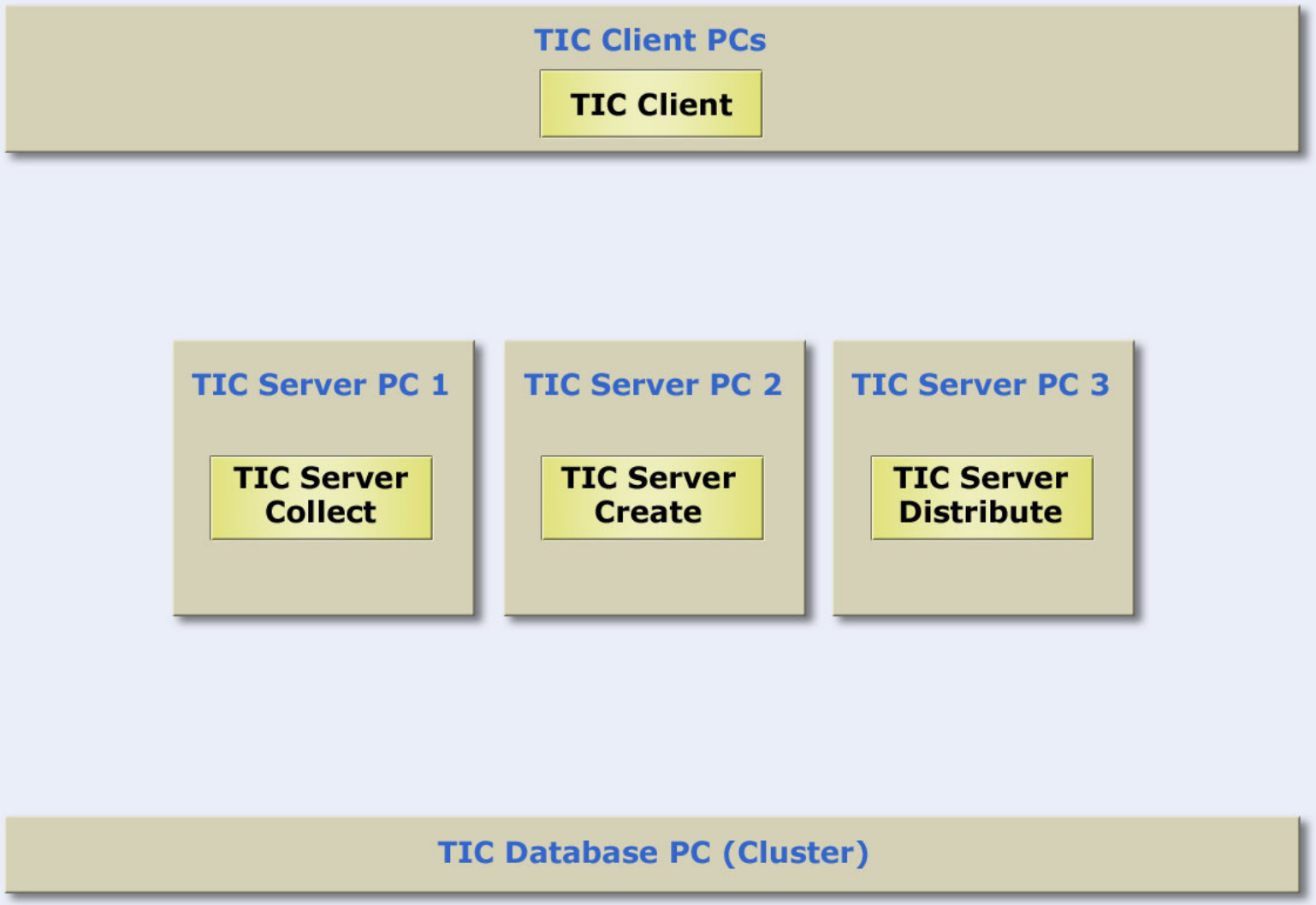
Processor	Dual 32-bit 3 GHz Intel or compatible Pentium IV.
Operating system	Windows Server 2003.
System memory	2 GB free memory.
Hard-disk	100 GB free space as hardware SCSI RAID 0/1.
Network	100 Mbps TCP/IP.
Drive	DVD-ROM.
Graphics	XGA (1024x768).
Monitor	15”.
Time	Reliable time source (DCF 77 or SNTP).

- **Processor** Single 32-bit 3 GHz Intel or compatible Pentium IV.
- **Operating system** Windows Vista.
- **System memory** 1 GB free memory.
- **Hard-disk** 10 GB free space.
- **Network** 100 Mbps TCP/IP.
- **Drive** DVD-ROM.
- **Graphics** XGA (1024x768), DirectX 9c, 128 MB memory.
- **Monitor** 17”.
- **Time** Reliable time source (DCF 77 or SNTP).

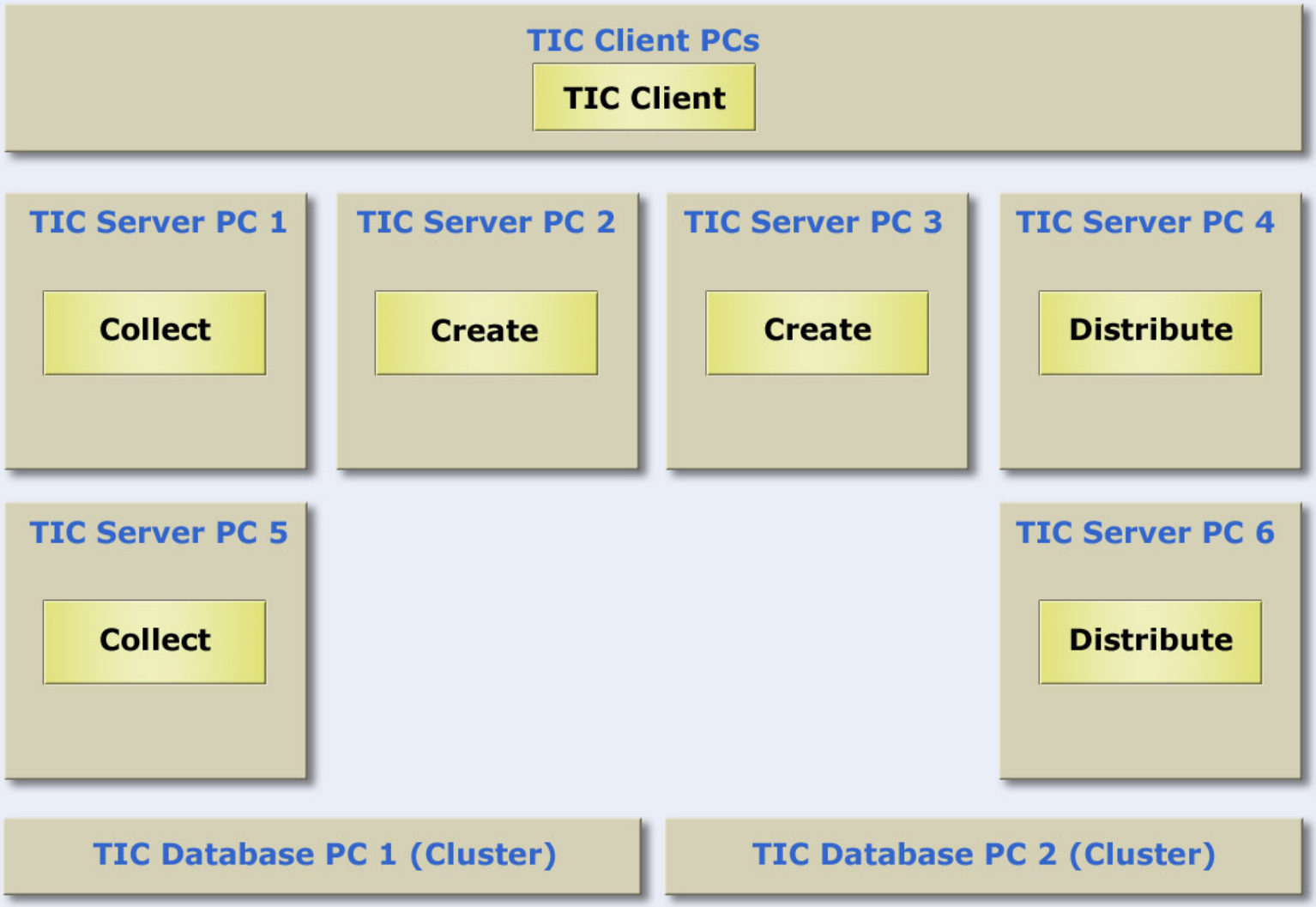
- **Processor** Single 32-bit 3 GHz Intel or compatible Pentium IV.
- **Browser** MS Internet Explorer 6.0.
- **System memory** 512 MB free memory.
- **Network** 100 Mbps TCP/IP.
- **Graphics** XGA (1024x768).
- **Monitor** 17”.
- **Time** Reliable time source (DCF 77 or SNTP).

Implement
Plan typical size




TIC Client PCs
TIC Client
TIC Server PC 1
TIC Server Collect
TIC Server PC 2
TIC Server Create
TIC Server PC 3
TIC Server Distribute
TIC Database PC (Cluster)

Implement
Plan large size



- **Custom TIC Server components can be developed**
  - Collect.
  - Distribute.
  - Automatically create.
- **Custom browser clients can be developed.**
- **Development can be provided by**
  - Supplier.
  - Customers and partners can customize if trained and agreed for support.

- **Project**
  - Agree customer requirements.
  - Implement and operate the system.
- **System**
  - Result of the implementation of the delivered products and services as joint effort by the customer and the supplier.
- **Implement**
  - Plan, develop, deliver, deploy (install, configure, train, test), accept.
- **Operate**
  - Use, support, maintain.

Contact Information

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